

REMARKS

Initially, Applicants affirm the provisional election to prosecute the invention of Group I, claims 38-48, drawn to a cleaning process. By this amendment, non-elected claims 49-62 have been canceled without prejudice to, or disclaimer of, Applicants' rights to prosecute the subject matter thereof in an appropriate divisional application. The specification has been amended to update the continuing data. No further correction is deemed necessary. Claims 38-48 are presented for further examination.

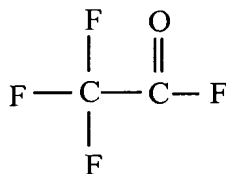
The rejection of claims 38, 47 and 48 under 35 U.S.C. § 102(b) over Sakaguchi, JP 8-291299 is respectfully traversed.

The present invention relates to a cleaning method using a cleaning gas comprising a hypofluorite. The instant specification at page 3, lines 24-26 clearly defines a hypofluorite as a compound having at least one O-F group in the molecule. Sakaguchi does not disclose a hypofluorite. Rather, the gases of Sakaguchi are substantially different from the claimed gases.

Sakaguchi discloses a cleaning gas comprising a perfluorocarbon containing a heteroatom, such as perfluoroalkylamine, perfluoroalkyl ether, perfluoroalkyl ketone, perfluoroalkylcarbonyl fluoride, or perfluoro cyclic ether (Abstract). Examples of the perfluorocarbon include CF_3COF (trifluoroacetyl fluoride), $\text{C}_2\text{F}_5\text{COF}$ (pentafluoropropionyl fluoride), $\text{C}_3\text{F}_7\text{COF}$ (heptafluorobutyryl fluoride) and CF_3COCF_3 (hexafluoroacetone) (see paragraph 7 of the translated version of Sakaguchi).

At first glance, the perfluorocarbons of Sakaguchi may seem to be similar to CF_3OF , $\text{CF}_3\text{CF}_2\text{OF}$, $\text{CF}_3\text{CF}_2\text{CF}_2\text{OF}$, and $(\text{CF}_3)_2\text{CFOF}$ respectively, which are disclosed as exemplary hypofluorites in claim 40 of the present application. However, the compounds are quite dissimilar.

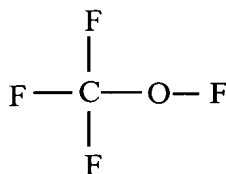
In each of the above-mentioned compounds of Sakaguchi, the group CO represents a carbonyl group ($\text{C}=\text{O}$), and the fluorine atom is bonded to carbon, not to oxygen, as can be seen, for example, from the structural formula of CF_3COF :



Thus, the above-mentioned perfluorocarbons of Sakaguchi do **not** contain an O-F group as required in a hypofluorite. Instead, as shown in the above formula, all of the fluorine atoms of CF_3COF are directly bonded to the carbon atoms.

Moreover, the C-F bonding energy is large at 107 kcal/mol (447.26 kJ/mol). Therefore, it is difficult to break the C-F bond, and the fluorine atoms of CF_3COF are not easily released from the carbon atoms. On the other hand, the bonding energy between the CF_3 and COF moieties in CF_3COF is small and is only 4563.61 J/mol (4.56361 kJ/mol). Thus, CF_3COF is easily dissociated into CF_3- and $-\text{COF}$.

In contrast, the claimed hypofluorites contain at least one O-F bond, as shown, for example, by the structural formula of CF_3OF :



The O-F bonding energy is 43.5 kcal/mol (182 kJ/mol), which is substantially smaller than that the C-F bonding energy. Therefore, the fluorine atom of the $-\text{OF}$ group of CF_3OF is easily liberated. In other words, the fluorine atom of the $-\text{OF}$ group of hypofluorites becomes very active in a chemical reaction, as compared with the fluorine atoms of, for example, CF_3COF , given their respective bonding energies.

Because Sakaguchi discloses perfluorocarbons gases and **not** hypofluorite gases as required by claim 38, reconsideration and withdrawal of the rejection are respectfully requested.

The rejection of Claims 39-46 under 35 U.S.C. § 103(a) over Sakaguchi in view of Barton, US 4,036,864 is also respectfully traversed.

Barton discloses a hypofluorite for use as a fluorinating agent (abstract). The allegation in paragraph 13 of the Office Action that it would have been obvious to modify "Sakaguchi's hypofluorite compound" is factually incorrect. As discussed above, Sakaguchi discloses perfluorocarbons and does **not** disclose hypofluorite compounds.

Sakaguchi and Barton disclose two completely different types of compounds. The Office action has not set forth any tenable basis as to why one would replace the perfluorocarbons of Sakaguchi with the hypofluorites of Barton. Accordingly, it would not have been obvious to make the modification as alleged by the Office Action. Reconsideration and withdrawal of the rejection are respectfully requested.

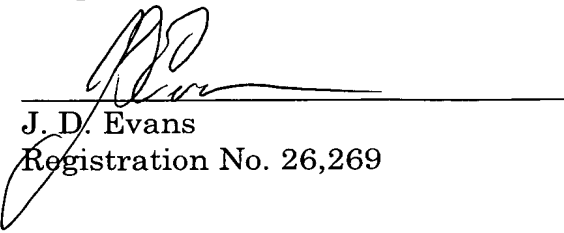
In view of the foregoing amendments and remarks, the application is respectfully submitted to be in condition for allowance, and prompt favorable action thereon is earnestly solicited.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned at (202) 624-2845 would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #038788.44893D1).

Respectfully submitted,

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